Extract taken from: In-service certification (WoF and CoF) > Forklifts > Brakes > Service brake and parking brake

8-1 Service brake and parking brake

Reasons for rejection

Mandatory equipment

1. A forklift does not have a service brake.

2. A forklift does not have a parking brake.

Condition

Service brake

3. There is corrosion damage (Note 2) within 150mm of a brake component mounting point.

4. The service brake pedal:

    a) is insecure, or

    b) is spongy (indicating air in the system), or

    c) creeps, or

    d) has a non-slip surface which has deteriorated to such an extent that the brake cannot be safely applied, or

    e) has excessive travel.

5. A vacuum hose or pipe (including connections) is:

    a) insecure, or

    b) leaking, or

    c) damaged (cracked, chafed, twisted, stretched, or corroded, eg showing signs of pitting or a noticeable decrease in the pipe’s outside diameter).

6. The brake vacuum servo (brake booster) is:

    a) not functioning fully or adequately, or

    b) leaking, or

    c) insecure.

7. The brake master cylinder is:

    a) leaking brake fluid, or

    b) insecure, or

    c) excessively corroded.

8. A brake valve is:

a) not operating (has eg a seized load sensing valve), or

b) leaking brake fluid, or

c) insecure, or

d) excessively corroded.

9. A brake pipe (including connections) is:

a) leaking brake fluid, or

b) insecure, or

c) deformed from its original shape, or

d) chafed, or

e) corrosion damaged, eg there are signs of pitting or a noticeable increase in the pipe's outside diameter.

10. A flexible hydraulic brake hose (including connections):

a) is leaking brake fluid, or

b) is insecure, or

c) bulges under pressure, or

d) is twisted, stretched or chafed, or

e) has an external sheathing which is cracked to the extent that the reinforcing cords are exposed, or

f) has metal connections which are excessively corroded, or

g) has an end fitting that is not attached to the hose by means of swaging, machine crimping or a similar process (Note 3).

11. A brake calliper:

a) shows visible signs of leaking, or

b) is insecure.

12. A brake backing plate is:

a) insecure, or

b) severely corroded, or

c) deformed from its original shape, or

d) cracked, or

e) contaminated by brake fluid, oil or grease.

13. A wheel cylinder:

a) shows visible signs of leaking, or

b) is insecure, or

c) is seized.

14. An ABS system component is damaged, insecure or missing.

15. A brake disc or drum is:

    a) worn beyond manufacturer's specifications (where visible without removing vehicle components), or

    b) fractured or otherwise damaged (where visible without removing vehicle components), or

    c) contaminated by brake fluid, oil or grease.

16. Brake friction material (where visible without removing vehicle components) is:

    a) worn below manufacturer's specifications, or

    b) separating from the brake pad backing plate or brake shoe, or

    c) contaminated by brake fluid, oil or grease.

17. A service brake component shows signs of heating or welding after original manufacture.

Parking brake

18. The parking brake lever:

    a) has excessive travel, or

    b) is insecure, or

    c) has mounting which is damaged, corroded, distorted or fractured within 150mm of the lever mounting, or

    d) mechanism or lever pivot bearing is worn or damaged so that the parking brake could be easily released by accident.

19. The parking brake cable:

    a) is knotted, frayed or excessively corroded, or

    b) has an auxiliary tensioner fitted, or

    c) has otherwise deteriorated so that it may affect the parking brake performance.

20. A parking brake actuating rod or guide:

    a) is excessively corroded, or

    b) is excessively worn, or

    c) has otherwise deteriorated so that it may affect the parking brake performance.

21. A parking brake component shows signs of heating or welding after original manufacture.

Performance

Service brake

22. The service brake cannot be applied in a controlled and progressive manner.

23. When the service brake is applied without assistance from the engine:

    a) the unladen forklift (GVM 3500kg or less) does not stop within 9m from a speed of 30 km/h (average brake efficiency of 40%), or

b) the unladen forklift (GVM more than 3500kg) does not stop within 7m from a speed of 30 km/h (average brake efficiency of 50%), or

c) the unladen forklift (maximum speed 20–29km/h) does not stop within 4m from a speed of 20 km/h (average brake efficiency of 40%), or

d) the unladen forklift (maximum speed less than 20km/h) does not stop within 4m from its maximum speed.

24. When the service brake is applied:

a) the vehicle vibrates under braking to the extent that the control of the vehicle is adversely affected, or

b) the brake fails to release immediately after the brake pedal has been released, or

c) the directional control is affected (eg there is swerving to one side, or the brakes on one side apply more slowly than on the other side).

25. The brake system warning lamp or self-check system, if fitted, indicates a defect in the brake system (this does not apply to brake pad wear warning systems).

Parking brake

26. When the parking brake is applied it does not hold:

a) the vehicle at rest on a slope of one in six (ie a 17% or 9° slope), or

b) the wheels on a common axle stationary against attempts to drive the vehicle away.

Note 1 Definitions

Service brake means a brake for intermittent use that is normally used to slow down and stop a vehicle.

Parking brake means a brake readily applicable and capable of remaining applied for an indefinite period without further attention. A parking brake may be lever operated, or may be a transmission lock or a service brake that is capable of being locked in the applied position.

Note 2

Corrosion damage is where the metal has been eaten away, which is evident by pitting. The outward sign of such corrosion damage is typically displayed by the lifting or bubbling of paint. In extreme cases, the area affected by the corrosion damage will fall out and leave a hole.

Note 3

Hose end fittings that can be undone using hand tools are unacceptable.

Note 4

If a brake is fitted with an inspection port plug, this must be removed for inspection of the brake components.

Summary of legislation

Applicable legislation

- Land Transport Rule: Light-Vehicle Brakes 2002
- Land Transport Rule: Heavy-Vehicle Brakes 2006.

Mandatory equipment

1. A forklift must have:

    a) a service brake, and

    b) a parking brake.

Permitted equipment

2. A forklift may be fitted with a warning system that is part of, or associated with, the use of a brake component or system.

Condition

3. A brake must be in good condition and within safe tolerance of its state when manufactured.

4. The brake friction surfaces must be within safe tolerance of their state when manufactured, and must not be scored, weakened or damaged to the extent that the safety performance of the brake is adversely affected.

Performance

5. The service brake must be able to be applied in a controlled and progressive manner.

6. When the brake is applied:

    a) the vehicle or its controls must not vibrate to the extent that control of the vehicle is adversely affected, and

    b) the braking effort on each wheel must provide stable and efficient braking without adverse effect on the directional control of the vehicle, and

    c) if the vehicle is equipped with an anti-lock braking system (ABS), the wheels must not lock, other than when the speed of the vehicle falls below the ABS activation parameters set by the vehicle manufacturer.

7. A brake warning system must function correctly (does not apply to a brake pad wear warning system).

Service brake

8. The service brake of a forklift that is operated on a hard, dry, level surface that is free of loose material and without assistance from the compression of the engine or other retarders, must operate in the following manner:

    a) the service brake must stop the unladen forklift (GVM 3500kg or less) within a distance of 9m from a speed of 30km/h (average brake efficiency of 40%), or

    b) the service brake must stop the unladen forklift (GVM more than 3500kg) within a distance of 7m from a speed of 30km/h (average brake efficiency of 50%), or

    c) the service brake must stop the unladen forklift (with a maximum speed of 20–29km/h) within a distance of 4m from a speed of 20km/h (average brake efficiency of 40%), or

d) the service brake must stop the unladen forklift (with a maximum speed of less than 20km/h) within a distance of 4m from its maximum speed.

Parking brake

9. A parking brake must hold the unladen forklift at rest on a slope of one in six.